

ESS-DIVE Bootcamp

October 29th, 2020 10:00 - 11:00 am PDT

Madison Burrus, Fianna O'Brien



Robert Crystal-Ornelas, Zarine Kakalia, Emily Robles, Deb Agarwal, Charuleka Varadharajan, Shreyas Cholia, Valerie Hendrix, Joan Damerow, Hesham Elbashandy, Mario Melara, Makayla Shepherd, Maegen Simmonds, Cory Snively, and Karen Whitenack



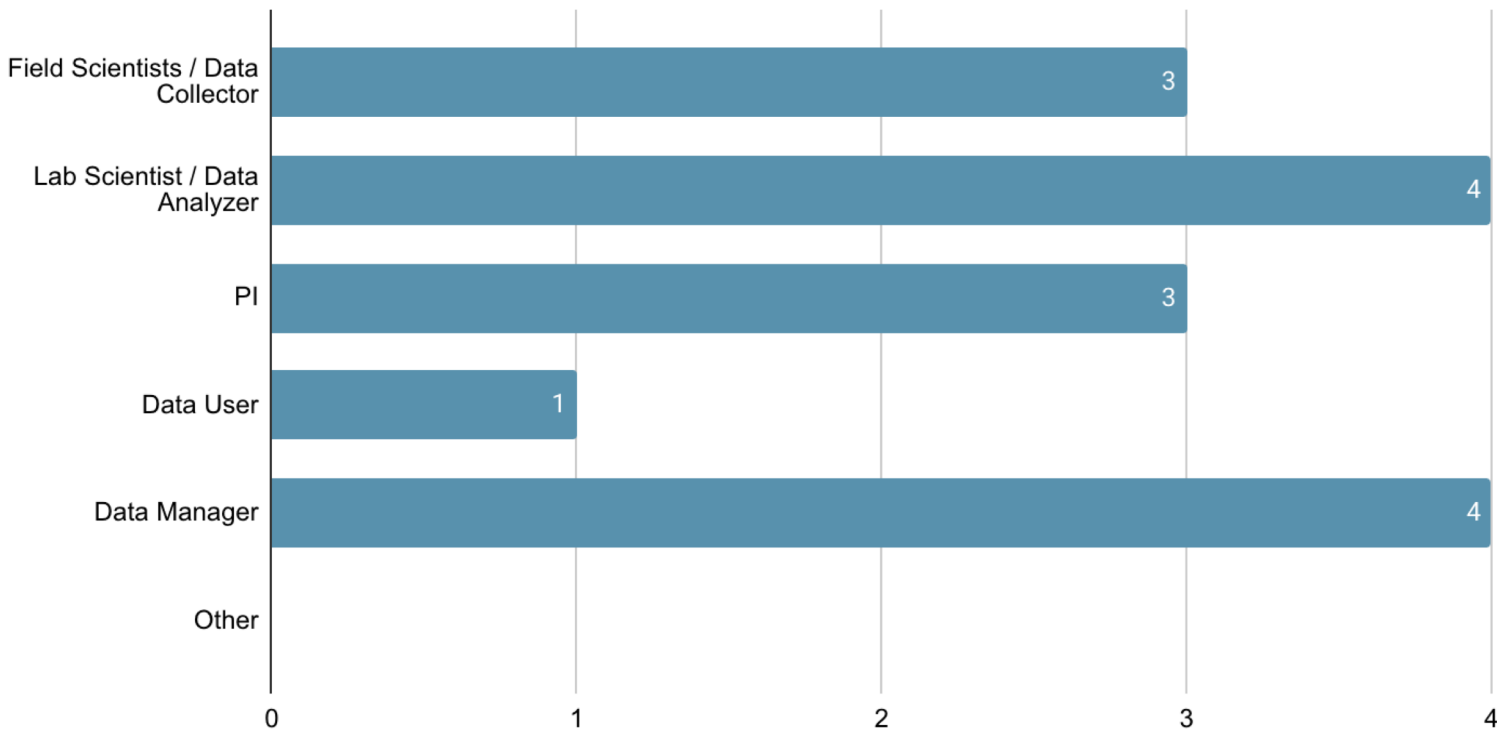
ESS-DIVE October 2020 Webinar

Bootcamp Overview

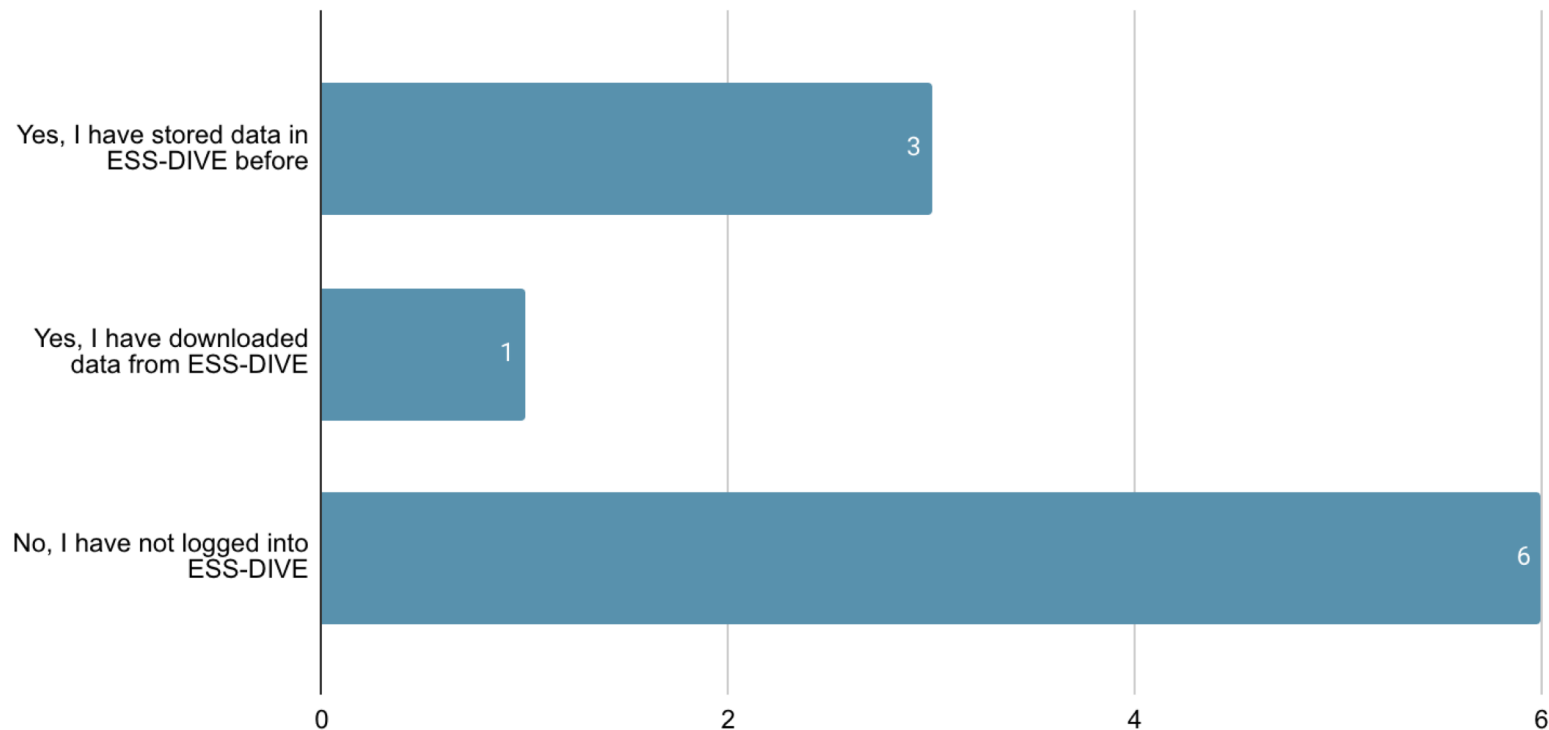
- How to register to become an ESS-DIVE **data contributor**
- How to **submit and publish data** to ESS-DIVE
- How to check the **quality of your metadata** before requesting to publish
- How to **cite data** published on ESS-DIVE

This is an interactive webinar! We have demos, polls, and question breaks prepared.

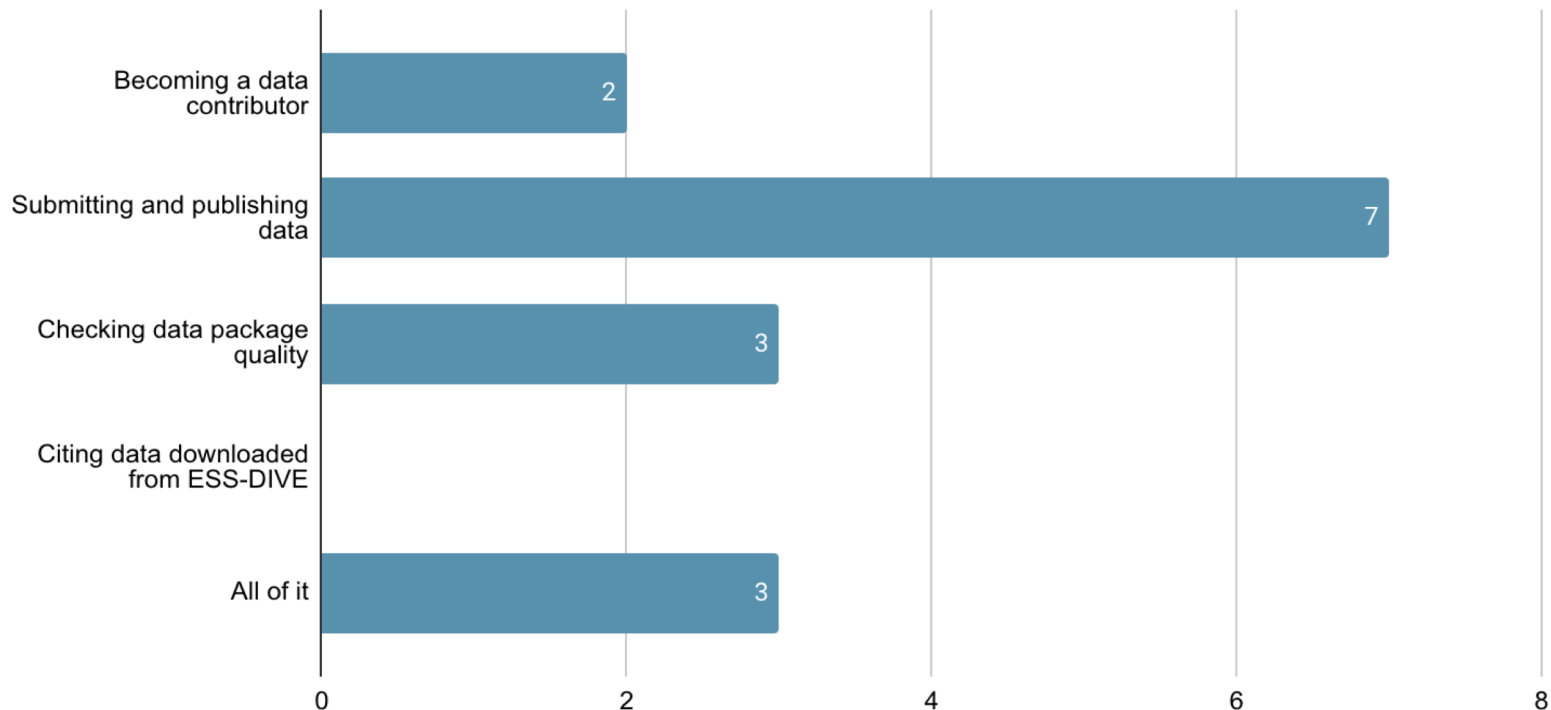
What is your primary role in your research group?



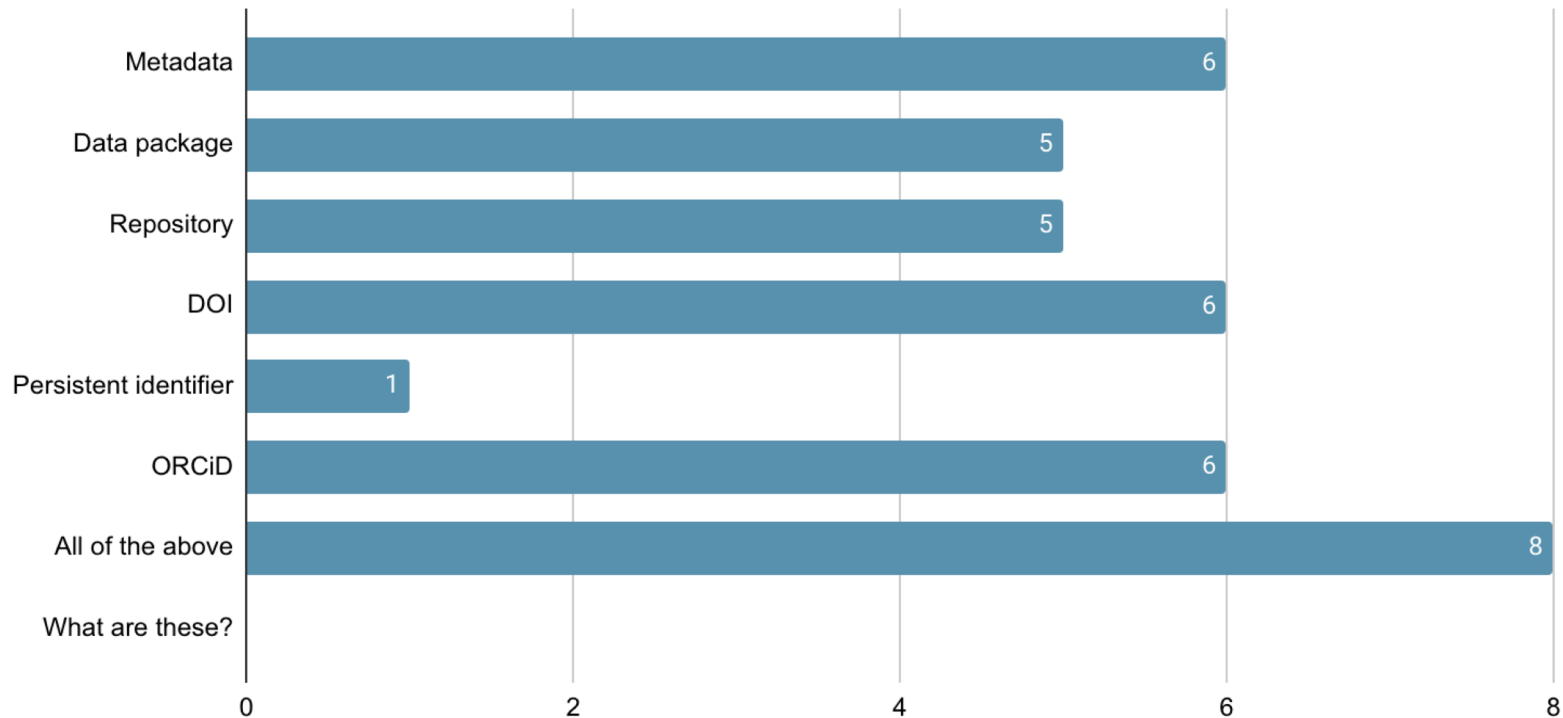
Have you used ESS-DIVE before?



Which section are you most interested in learning about?



Which of these terms are you familiar with?

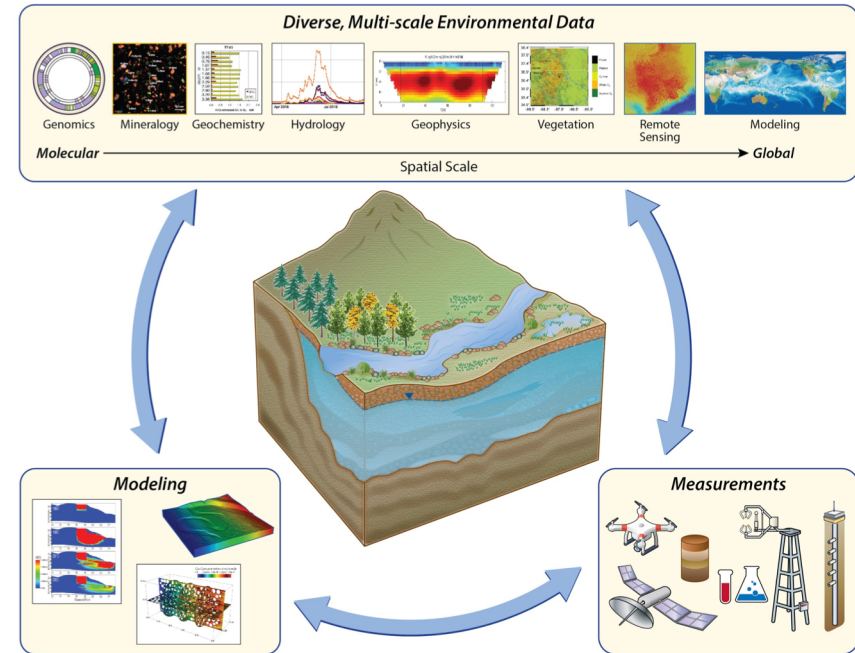


What is ESS-DIVE?

What is ESS-DIVE?



- <https://ess-dive.lbl.gov/>
- A **Repository** for Earth and Environmental Data funded by the Department of Energy & maintained by the Lawrence Berkeley National Laboratory.
- ESS-DIVE stores **diverse environmental data types** such as remote imagery, water quality, geophysical and model data

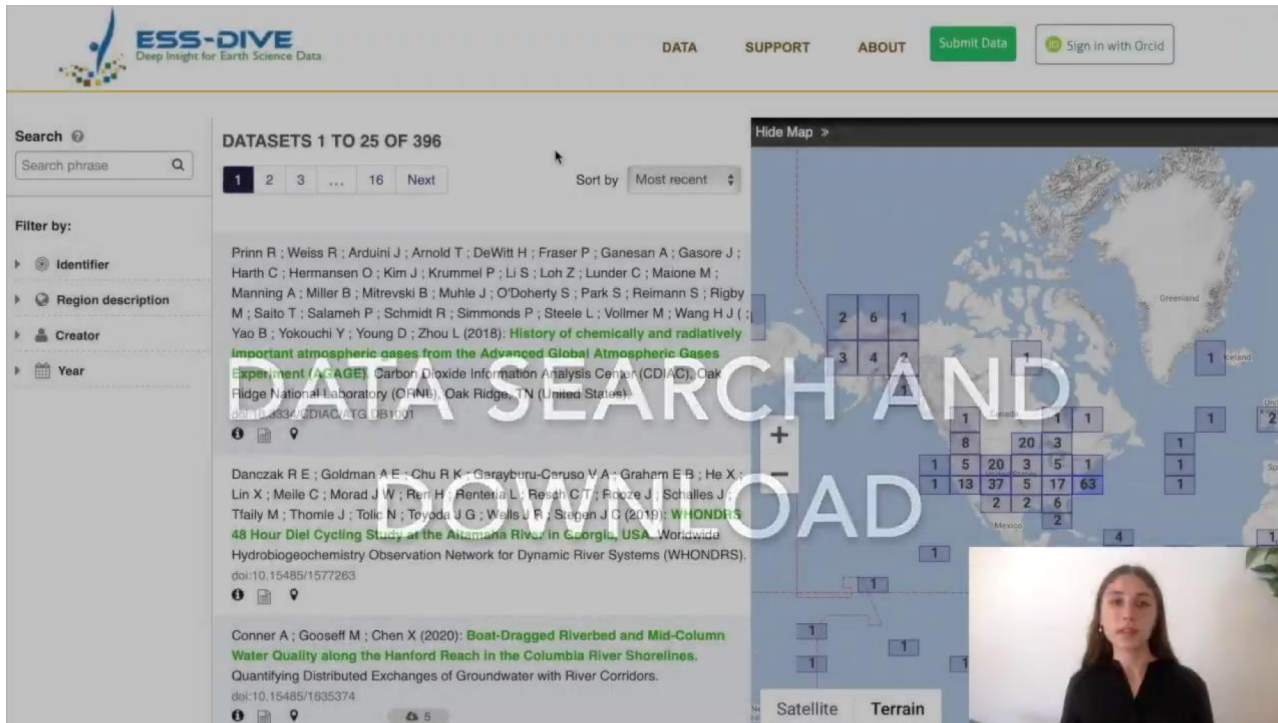


Varadharajan et al. (2019)¹

ESS-DIVE's Goal

- The goal of our repository is to provide DOE-funded researchers a centralized location to store their environmental research data for long-term preservation & publication
- ESS-DIVE allows users to:
 - Upload and download data
 - Publish data with persistent identifier for citations
 - Search public data



Search and Download Demo



The screenshot displays the ESS-DIVE website interface. At the top, the logo and tagline 'Deep Insight for Earth Science Data' are visible, along with navigation links for DATA, SUPPORT, and ABOUT, and buttons for 'Submit Data' and 'Sign in with Orcid'. The main content area is divided into a search sidebar on the left and a results section on the right. The search sidebar includes a search bar and filter options for Identifier, Region description, Creator, and Year. The results section shows 'DATASETS 1 TO 25 OF 396' with a pagination bar and a 'Sort by' dropdown set to 'Most recent'. Three dataset entries are listed, each with author names, a title, a description, and a DOI. A map on the right side of the results section shows a grid of data points over a geographical area, with a 'Hide Map' button above it. A video inset in the bottom right corner shows a woman speaking.

ESS-DIVE
Deep Insight for Earth Science Data

DATA SUPPORT ABOUT Submit Data Sign in with Orcid

Search 
Search phrase 

Filter by:

- Identifier
- Region description
- Creator
- Year

DATASETS 1 TO 25 OF 396


1 2 3 ... 16 Next

Sort by Most recent

Prinn R ; Weiss R ; Arduini J ; Arnold T ; DeWitt H ; Fraser P ; Ganesan A ; Gasore J ; Harth C ; Hermansen O ; Kim J ; Krummel P ; Li S ; Loh Z ; Lunder C ; Maione M ; Manning A ; Miller B ; Mitrevski B ; Muhle J ; O'Doherty S ; Park S ; Reimann S ; Rigby M ; Saito T ; Salameh P ; Schmidt R ; Simmonds P ; Steele L ; Vollmer M ; Wang H J ; Yao B ; Yokouchi Y ; Young D ; Zhou L (2018): **History of chemically and radiatively important atmospheric gases from the Advanced Global Atmospheric Gases Experiment (A-GAGE)**. Carbon Dioxide Information Analysis Center (CDIAC), Oak Ridge National Laboratory (ORNL), Oak Ridge, TN (United States).
doi:10.3334/CDIAC/CTG_UB1001

Danczak R E ; Goldman A E ; Chu R K ; Grayburu-Carusso V A ; Graham E B ; He X ; Lin X ; Meile C ; Morad J W ; Ren H ; Renteria L ; Resch C T ; Rooze J ; Schalles J ; Tfaily M ; Thomie J ; Tolic N ; Toyoda J G ; Wells J R ; Stepan J G (2019): **WHONDRS 48 Hour Diel Cycling Study at the Altamaha River in Georgia, USA**. Worldwide Hydrobiogeochemistry Observation Network for Dynamic River Systems (WHONDRS).
doi:10.15485/1577263

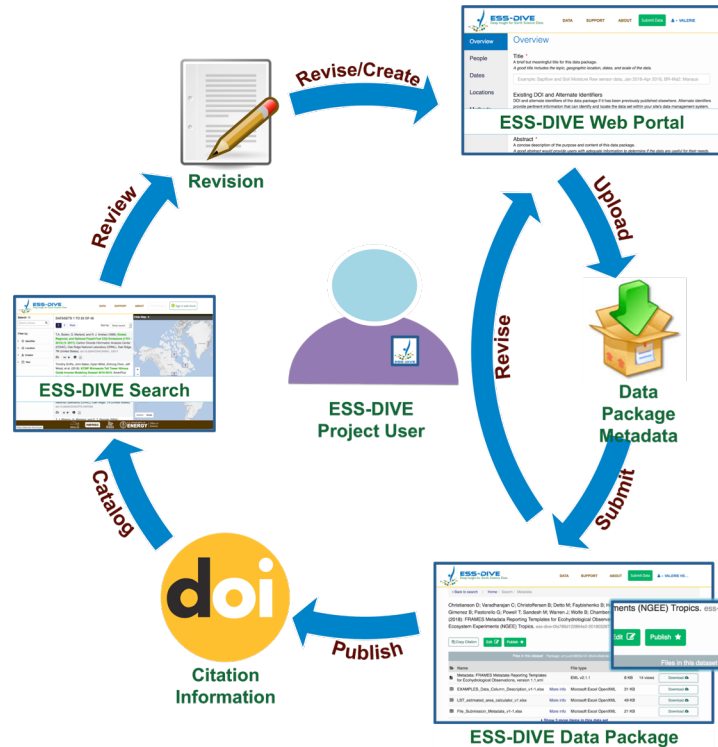
Conner A ; Gooseff M ; Chen X (2020): **Boat-Dragged Riverbed and Mid-Column Water Quality along the Hanford Reach in the Columbia River Shorelines**. Quantifying Distributed Exchanges of Groundwater with River Corridors.
doi:10.15485/1835374

Hide Map 

Satellite Terrain

More videos on [ESS-DIVE Team YouTube channel](#)

Publishing Data on ESS-DIVE



It's Easy!

ESS-DIVE Support provides **materials to guide users** through the data publication process.

Past webinars, tutorial videos, and help documentation can be found under the Support tab on our website

Varadharajan et al. (2019)¹

Terms to keep in mind



Data Storage

Repository

- A central location for long term data storage

Published

- Data that has been reviewed and is publicly accessible



Publishing Terms

Metadata

- Descriptive information about data files

Data Package

- Term we use to refer to both data files and metadata



Persistent Identifiers

ORCID

- For people; permanent link for your professional activities

DOI

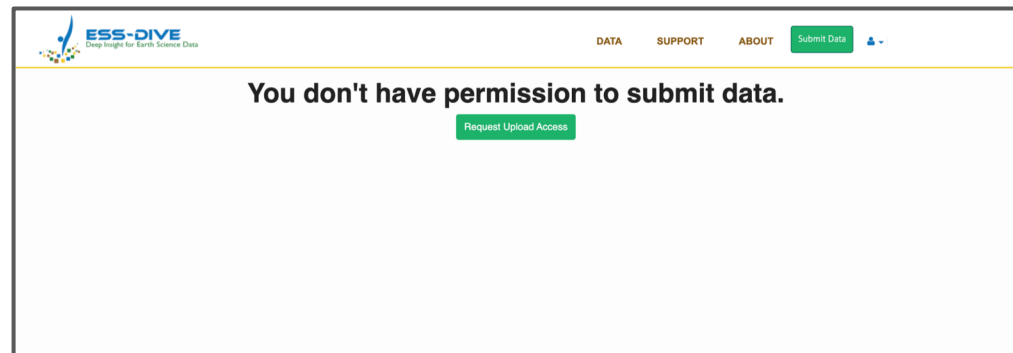
- For data; permanent link on the internet

How To Become a Data Contributor

Why is this step necessary?

You must be approved to store data on ESS-DIVE

- Logging in to ESS-DIVE with your ORCID lets you **download** data
- Registering as a **data contributor** lets you **upload** data



ORCID

Connecting Research
and Researchers



ESS-DIVE
Project User

How to Register as a Data Contributor

Log in to ESS-DIVE



01

Using your **ORCID**, sign into [ESS-DIVE](#).

Fill in Contributor Form



02

Click the **Support** tab > Click **New User?** > Click on the “[new data contributor form](#)” link

Complete Profile



03

Wait for an email response. Follow the instructions in your email.

New Data Contributor Form FAQ

Two important points to review

- The data package publisher will be your **DOE Project Affiliation**
 - ESS-DIVE is not the data package publisher
- For the PI Contact Information, please enter the **primary** or **lead PI** of your project

DOE Project Affiliations *

List all DOE Office of Science Environmental Systems Science projects/SFA programs that you are associated with as a team member or collaborator. Click bit.ly/ess-dive-projects to view a list of ESS projects. If you are not affiliated with a DOE ESS project, contact ess-dive-support@lbl.gov first.

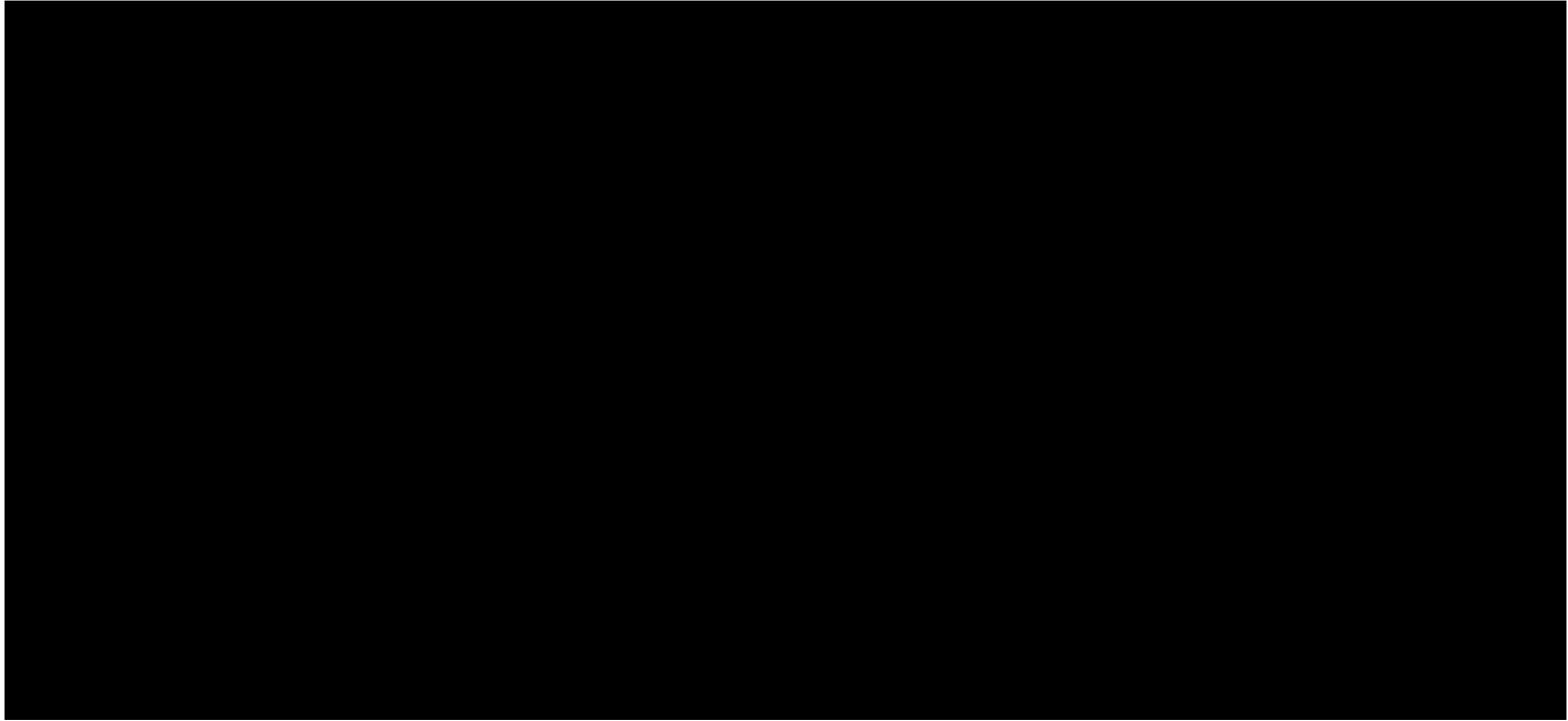
Your answer

Project Principal Investigator (PI) Contact Information *

The Project PI (or lead PI) is the individual responsible for the preparation, conduct, and administration of the research grant for your affiliated project(s). Enter the Project PI contact information in the following format: PI Name, PI email. Enter PI contact information for each affiliated project. Click bit.ly/ess-dive-projects to view a list of ESS projects and project PIs. If your project is in this list, enter the PI contact information listed there. The project PI(s) will be notified of your request to upload data to ESS-DIVE.

Your answer

Registration Demo

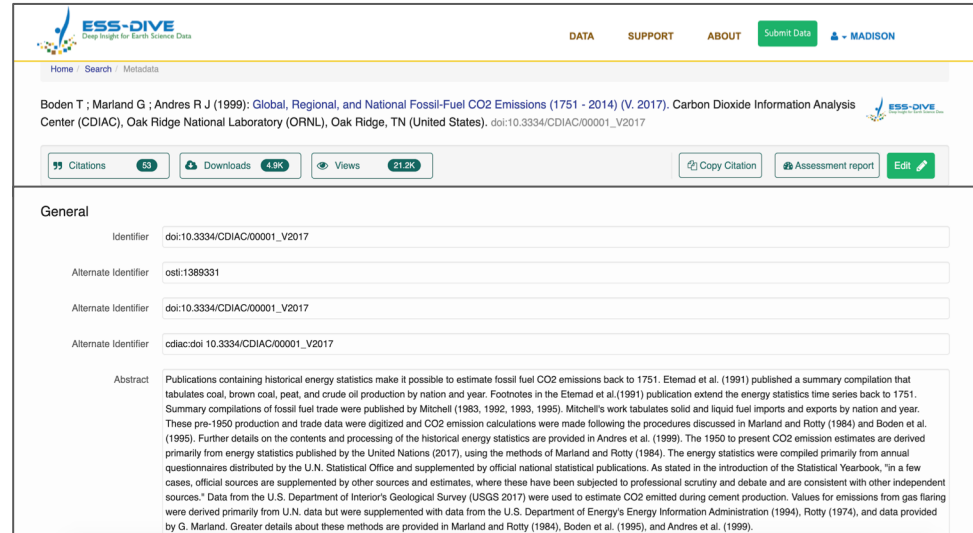


How to Create and Submit Data Packages

What is a Data Package?

Data Packages have two primary components

- **Data Files**
- **Metadata:** a collection of information that describes the **content** and **scope** of the data files



The screenshot shows the ESS-DIVE website interface. At the top, there's a navigation bar with links for DATA, SUPPORT, ABOUT, and a Submit Data button. Below this is a search bar and a user profile for MADISON. The main content area displays the title of the data package: 'Boden T ; Marland G ; Andres R J (1999): Global, Regional, and National Fossil-Fuel CO2 Emissions (1751 - 2014) (V. 2017). Carbon Dioxide Information Analysis Center (CDIAC), Oak Ridge National Laboratory (ORNL), Oak Ridge, TN (United States). doi:10.3334/CDIAC/00001_V2017'. Below the title, there are statistics for Citations (53), Downloads (4.9K), and Views (21.2K). There are also buttons for Copy Citation, Assessment report, and Edit. The 'General' section contains fields for Identifier (doi:10.3334/CDIAC/00001_V2017), Alternate Identifier (osti:1389331), and another Alternate Identifier (doi:10.3334/CDIAC/00001_V2017). The 'Abstract' section contains a detailed description of the data package, mentioning its origin from the U.S. Department of Energy's Energy Information Administration and its use in estimating CO2 emissions from 1751 to 2014.

Boden et al. (1999)²

Data Package: what exactly goes in it?

Author contributions

Based level of contributor effort for portions of data - **author order**

Data in a publication

All data (raw or processed) that went into the publication

Data type

Particular data type from a project - e.g. continuously generated sensor data, sample data, data synthesis product

Field Campaign or Time Period

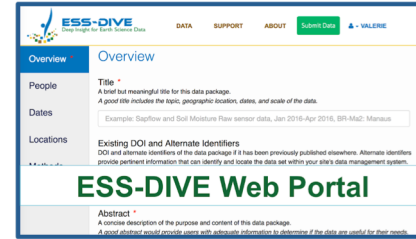
Data from a field campaign or season that need to be viewed together



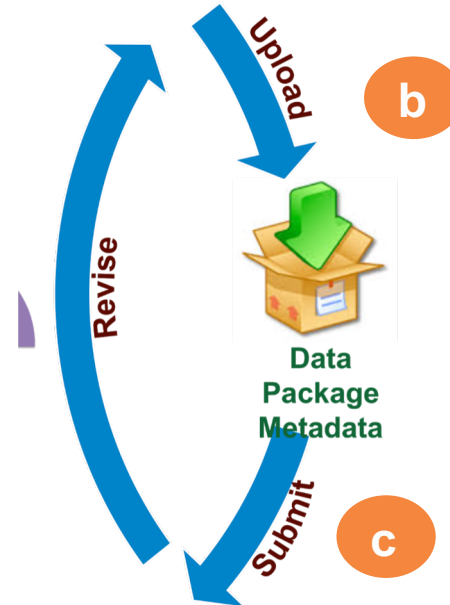
Step One: Submit

Click the **Submit Data** button at the top of the page to start a new data package

- **Fill out** all required metadata fields
- **Upload** data files
- Hit the **Submit Dataset** button at the bottom of the page.



a




Untitled dataset. null. ess-dive-2d796d6b8f2f701-20201028T235153602.

To submit a new data package or make major revisions to an existing data package

1. Add files
2. Enter the required * fields in the sections below
3. Hit the submit button, which appears after the first metadata entry

Starts submission

Files	Size	Type	Status
<div><div>▼</div><div></div></div> Untitled dataset			<div><div>+</div>Add Files</div>

Add files to start your dataset

+

Add Files

Overview *

Overview

People

Dates

Title *

A brief but meaningful title for this data package.

A good title includes the topic, geographic location, dates, and scale of the data.

Saves submission

By submitting this record, you agree to the [ESS-DIVE terms of use](#).

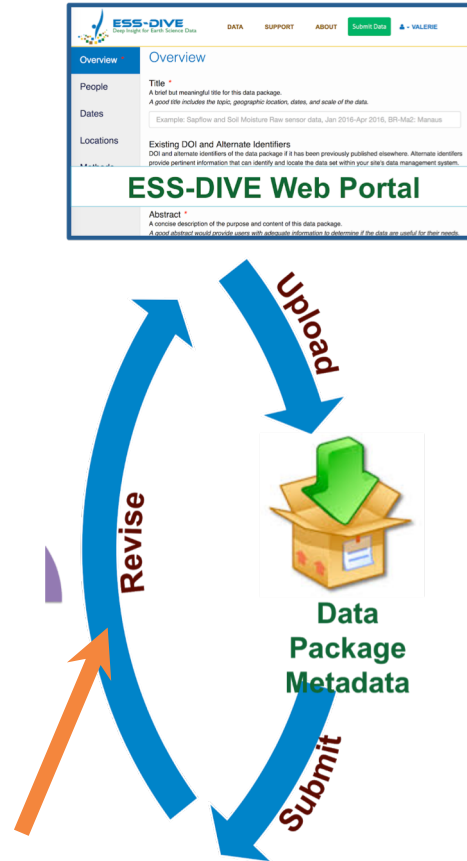
Submit Dataset

Step Two: Revise



Don't worry about completeness!

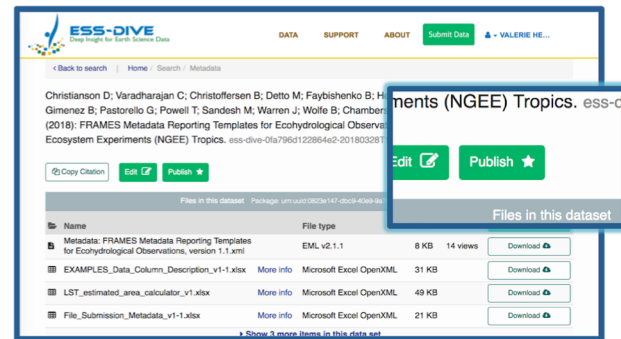
- A submitted data package is not a final product
- After you submit, you can **make changes** to your data package
- Submitting a data package means you are **saving** it in ESS-DIVE



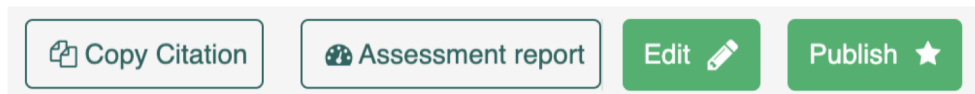
Step Three: Publish

Worry about completeness

- Make sure your **data files** are ready for public use
- Check that your **metadata** is complete using “Assessment Report”. **More on this later!**
- Hit the **Publish**★ button!



ESS-DIVE Data Package



Data Submission



Notice: ESS-DIVE in READ-ONLY mode 7/19 through 7/15 due to infrastructure upgrade.

ESS-DIVE
Deep Insights for Earth Science Data

DATA SUPPORT ABOUT [Submit Data](#) [+ EMILY](#)

Overview *
People
Dates
Locations
Methods

Abstract *
A concise description of the purpose and content of this data package.
A good abstract would provide users with adequate information to determine if the data are useful for their needs.

This is an example of an abstract.

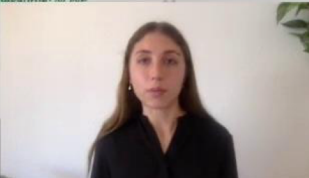
Keywords *
Keywords that should be associated with this data package to enable thematic searches.
Search for a keyword from the list or write in your own. Tab or click enter to add to the list below with one keyword per line. The list contains GCMD keywords.
Use autocomplete feature to pick from the existing keywords.

EARTH SCIENCE > AGRICULTURE > SOILS
Earth

Data Variables
Measurement variables present in the data package.
Search for a variable from the list or write in your own. Tab or click enter to add to the list below with one variable per line. The list contains GCMD and CF variables.
Use autocomplete feature to pick from the existing variables.

By submitting this record, you agree to the [ESS-DIVE terms of use](#).

Thesaurus: GCMD
Thesaurus: MOSE



More videos on [ESS-DIVE Team YouTube channel](#)

Submission and Publication Resources

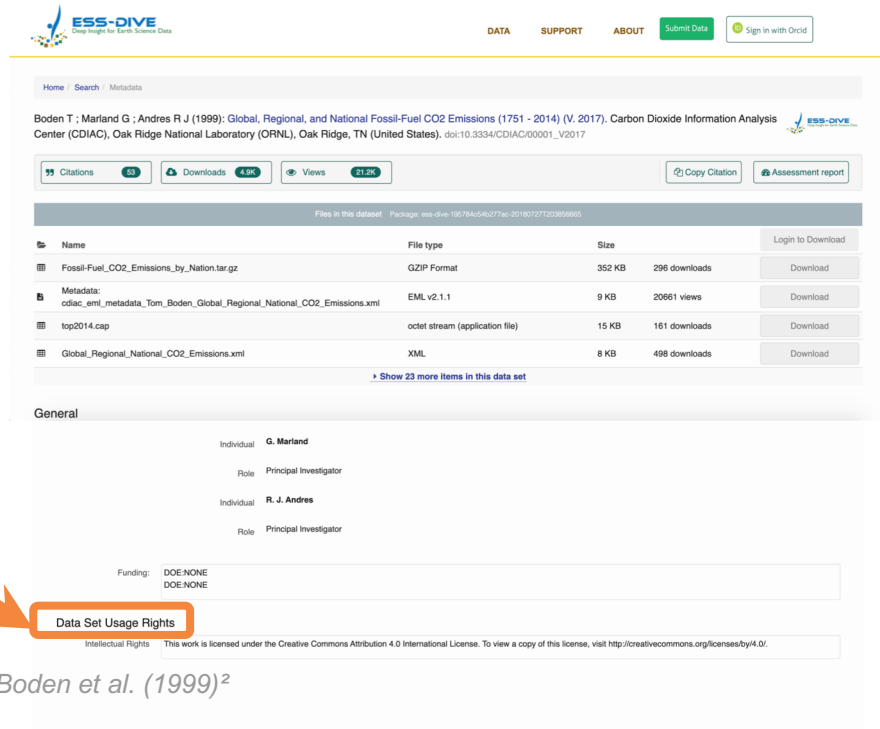
- Try **downloading** data from <https://data.ess-dive.lbl.gov>
- Use ESS-DIVE's **sandbox** server to trying uploading dummy data <https://data-sandbox.ess-dive.lbl.gov>
 - This is a testing space, you don't need to register to upload data here.
 - Just update your email address first

Citing ESS-DIVE Data

Citing an ESS-DIVE Data Package

Data usage rights determine citation permissions

- Check Data Set Usage Rights listed **at the bottom of every Data Package**
- Either Creative Commons **Attribution** (default) or **Public Use**



ESS-DIVE
Energy Science & Data Infrastructure

DATA SUPPORT ABOUT Submit Data Sign in with ORCID

Home Search Metadata

Boden T ; Marland G ; Andres R J (1999): [Global, Regional, and National Fossil-Fuel CO2 Emissions \(1751 - 2014\)](#) (V. 2017). Carbon Dioxide Information Analysis Center (CDIAC), Oak Ridge National Laboratory (ORNL), Oak Ridge, TN (United States). doi:10.3334/CDIAC/00001_V2017

Citations 53 Downloads 4.5K Views 21.2K Copy Citation Assessment report

Files in this dataset Package: ess-dive/180784c5d6277ac-20180727T203056665

Name	File type	Size	Downloads	Login to Download
Fossil-Fuel_CO2_Emissions_by_Nation.tar.gz	GZIP Format	352 KB	296 downloads	Download
Metadata: cdiac_eml_metadata_Tom_Boden_Global_Regional_National_CO2_Emissions.xml	EML v2.1.1	9 KB	20661 views	Download
top2014.cap	octet stream (application file)	15 KB	161 downloads	Download
Global_Regional_National_CO2_Emissions.xml	XML	8 KB	498 downloads	Download

Show 23 more items in this data set

General

Individual **G. Marland**
Role Principal Investigator

Individual **R. J. Andres**
Role Principal Investigator

Funding: DOE NONE
DOE NONE

Data Set Usage Rights

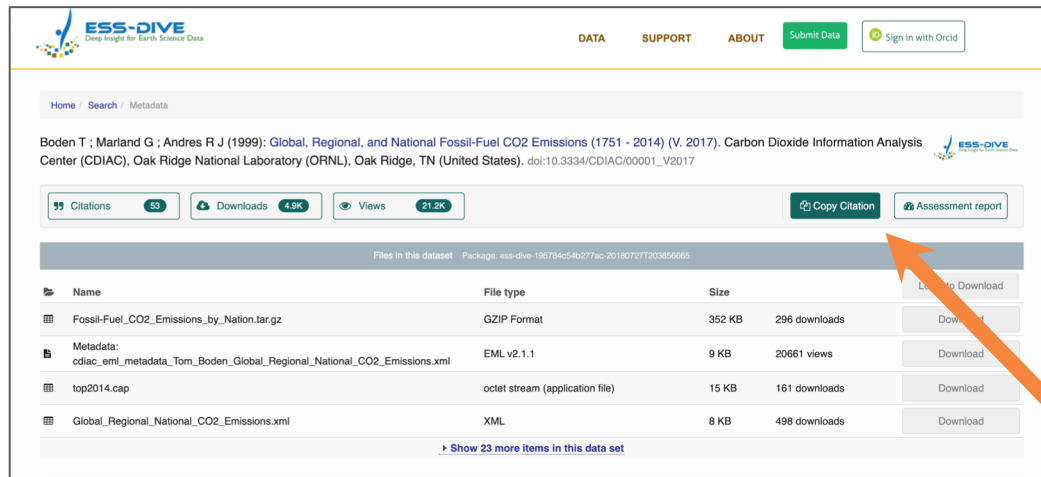
Intellectual Rights This work is licensed under the Creative Commons Attribution 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>.

Boden et al. (1999)²

Citing an ESS-DIVE Data Package

Citing data packages is easy on ESS-DIVE

- Use **Copy Citation** button to store Data Package Citation to Clipboard



Home / Search / Metadata

Boden T ; Marland G ; Andres R J (1999): Global, Regional, and National Fossil-Fuel CO2 Emissions (1751 - 2014) (V. 2017). Carbon Dioxide Information Analysis Center (CDIAC), Oak Ridge National Laboratory (ORNL), Oak Ridge, TN (United States). doi:10.3334/CDIAC/00001_V2017

Citations 63
 Downloads 4.9K
 Views 21.2K
 Copy Citation
 Assessment report

Files in this dataset Package: ess-dive-195784c54b277ac-20180727T203856665

Name	File type	Size	Downloads	Download
Fossil-Fuel_CO2_Emissions_by_Nation.tar.gz	GZIP Format	352 KB	296 downloads	Download
Metadata: cdiac_eml_metadata_Tom_Boden_Global_Regional_National_CO2_Emissions.xml	EML v2.1.1	9 KB	20661 views	Download
top2014.cap	octet stream (application file)	15 KB	161 downloads	Download
Global_Regional_National_CO2_Emissions.xml	XML	8 KB	498 downloads	Download

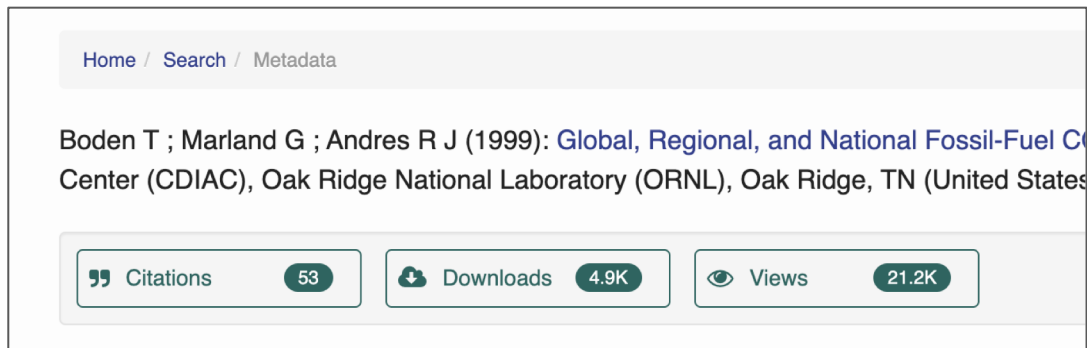
[Show 23 more items in this data set](#)

Boden et al. (1999)²

Certain metadata fields determine how the citation will look




Citation Metrics

- Every data package has citation metrics which inform you how many times your data package was cited
- Citation counts are not fully accurate because we don't get this information from journals

A screenshot of a web interface for a data package. At the top, there is a breadcrumb trail: "Home / Search / Metadata". Below this, the package title is displayed: "Boden T ; Marland G ; Andres R J (1999): Global, Regional, and National Fossil-Fuel CO2 Emissions (Global Emissions Database for Global Change - GED) Center (CDIAC), Oak Ridge National Laboratory (ORNL), Oak Ridge, TN (United States)". At the bottom, there are three metric boxes: "Citations" with a value of 53, "Downloads" with a value of 4.9K, and "Views" with a value of 21.2K. Each box contains an icon (quotes for citations, a download arrow for downloads, and an eye for views) and the metric name and value in a dark green pill-shaped button.

Home / Search / Metadata

Boden T ; Marland G ; Andres R J (1999): Global, Regional, and National Fossil-Fuel CO₂ Emissions (Global Emissions Database for Global Change - GED) Center (CDIAC), Oak Ridge National Laboratory (ORNL), Oak Ridge, TN (United States)

 Citations	 Downloads	 Views
53	4.9K	21.2K

What happens when you hit Publish

What happens when you click *Publish*?

Confirm



01

ESS-DIVE will email you to **confirm** that your publication request has been received.

Review



02

ESS-DIVE support team will **review** your data package and email you if they have any questions.

Public



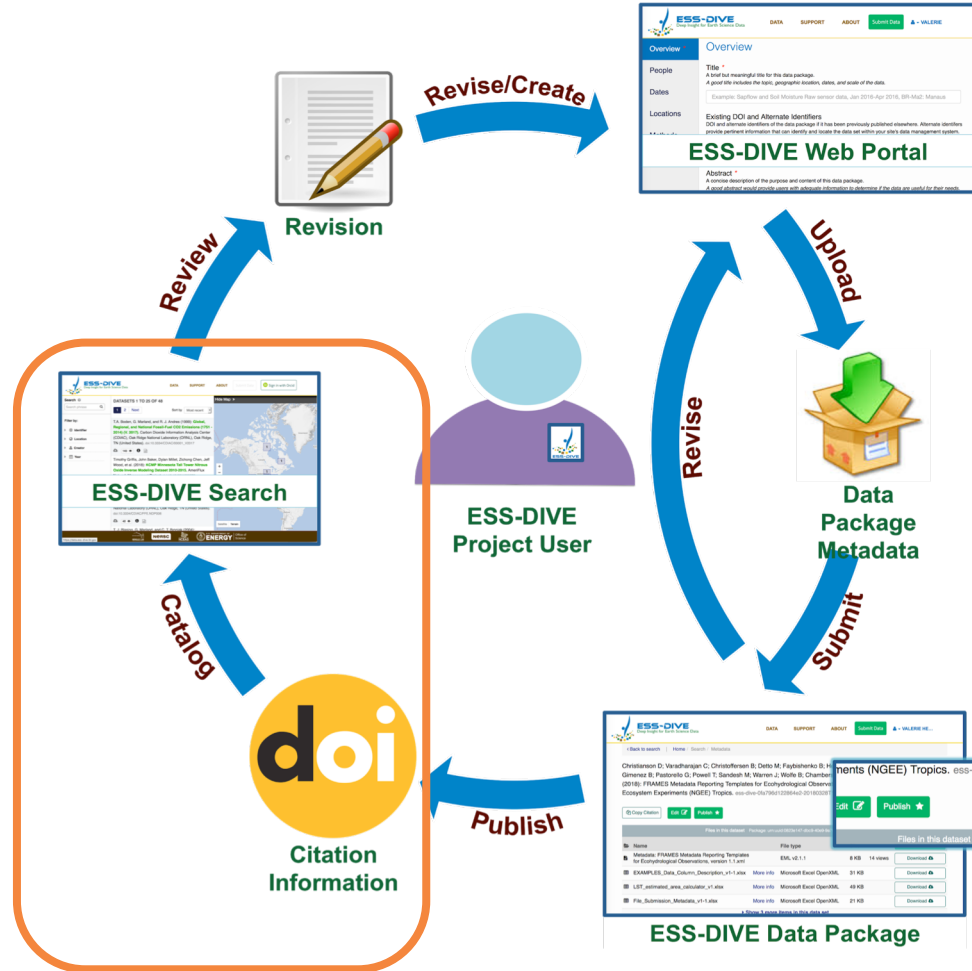
03

Once the data package has been reviewed it will be assigned a **DOI** and shared publicly.

What is a DOI?

Keeps track of data

- DOIs are **persistent identifiers** that are needed in order to cite your data later
- Like ESS-DIVE, most journals assign papers a DOI right when it's published



What the reviews look like from user's end

☐ ☆ ➤ Hesham, Emily 4

EDDOI-855 ESS-DIVE Publication Request "Dissolved Inorganic Carbon and Dissolved Org...

- The **submitter** and **dataset contact** will receive a confirmation email
- ESS-DIVE team reviews data package and **requests changes**
- After revisions, package is made **public with DOI**.

Hello,

We have finished reviewing your data package and request the following improvements to your metadata before publication:

1. Revise your abstract to include a statement about the purpose for why these data were generated and the research question it is intended to answer. Also, include a description of the file types in your data package and any software needed to utilize them.
2. As with your previous data package, please include the full citations for referenced data to accompany the DOIs entered.

Note that once the data package is published, it will be publicly available for search and download. The publication action cannot be undone, however, you will still be able to edit or retire the data package. As the dataset contact, you are responsible for obtaining consent for publication from the data package authors and notifying them about its status. Please respond to this message once you are finished making these revisions so that we can continue the approval process.

Thanks,

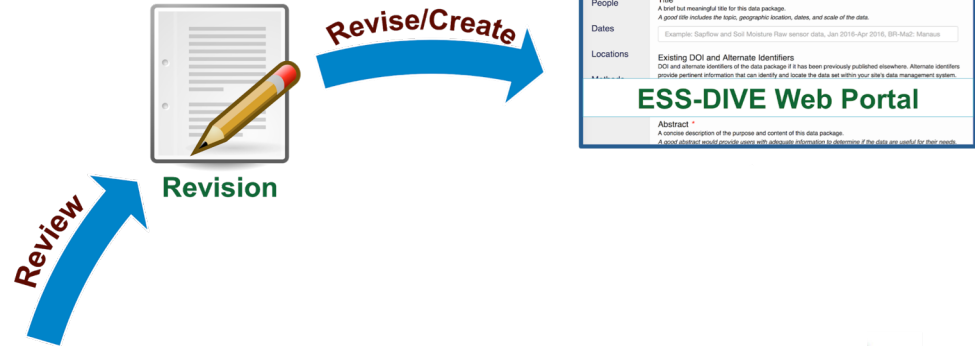
The ESS-DIVE Support Team

Email communications from ESS-DIVE review team

Revise if necessary

After publishing, you **CAN** make edits to your data package

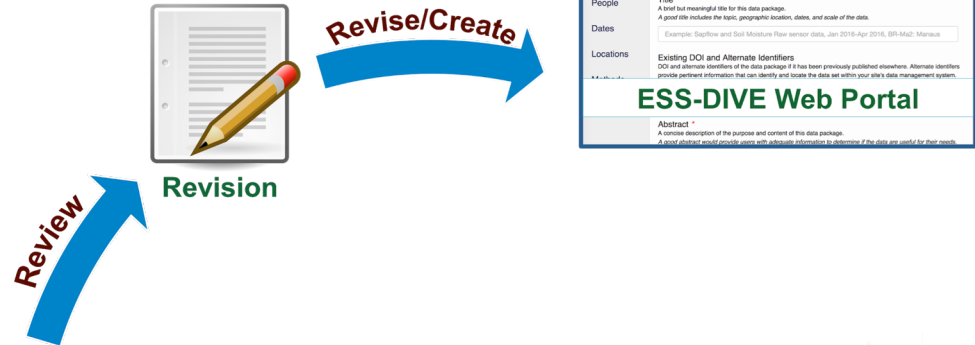
- **Minor** changes to your data package are allowed and encouraged
 - Fixing file headers or errors, editing abstract to include more contextual information, adjusting methods section.



Revise if necessary

Changing the scope of a published data package has downstream effects

- **Major** changes to your data package are **not encouraged** by ESS-DIVE
 - Changing author list, changing title name
 - Adding new data from new field campaigns



How to Check Metadata Quality

Why is it important to provide sufficient metadata?



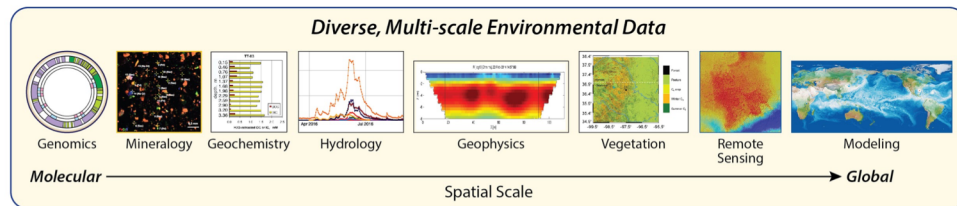
Making data **FAIR**:

Findable

Accessible

Interoperable

Reusable



Metadata can make **finding** data and determining data **use** much easier

What are ESS-DIVE's Metadata Requirements?



ESS-DIVE requires metadata to enable users to understand and interpret the data. The metadata should:

- Fully **explains** data without need of further reference
- Makes it useful from a **scientific** and **public** perspective
- **Avoids** undefined acronyms and project specific terms
- Provides author **contact** information
- Contains information about **data generation** methods

Metadata Quality Guidelines

Full description of metadata guidelines found on docs.ess-dive.lbl.gov

Each metadata field is broken down by:

- Format
- Description
- Example
- JSON-LD field name for API submission

Overview

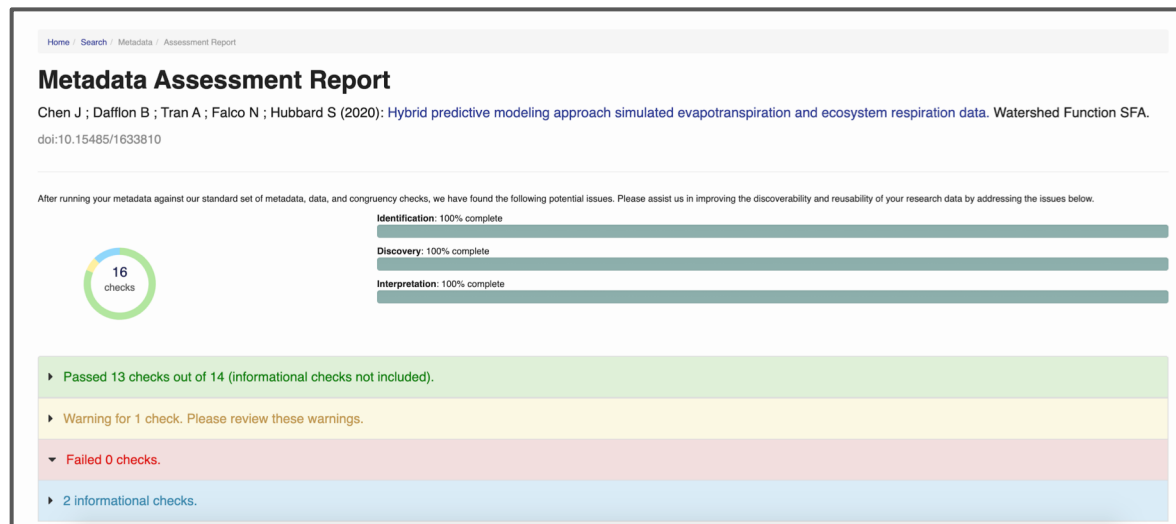
Title

Format	Free Text
Description	Include a title between 7-20 words long which contains information such as the topic, geographic location, dates, and scale of data. If data is associated with a journal publication, the title may include the journal name. Avoid unexplained acronyms or project-specific vocabulary. If there is an existing DOI for the data, use the same title.
Example	Raw sapflow and soil moisture data from January 2016-April 2016 in Manaus, Brazil
JSON-LD Field	name

The Assessment Report

Automatic report on metadata completeness

- This report appears on private and public datasets
- There are four major categories - data packages with failed checks are required to resolve them before publication

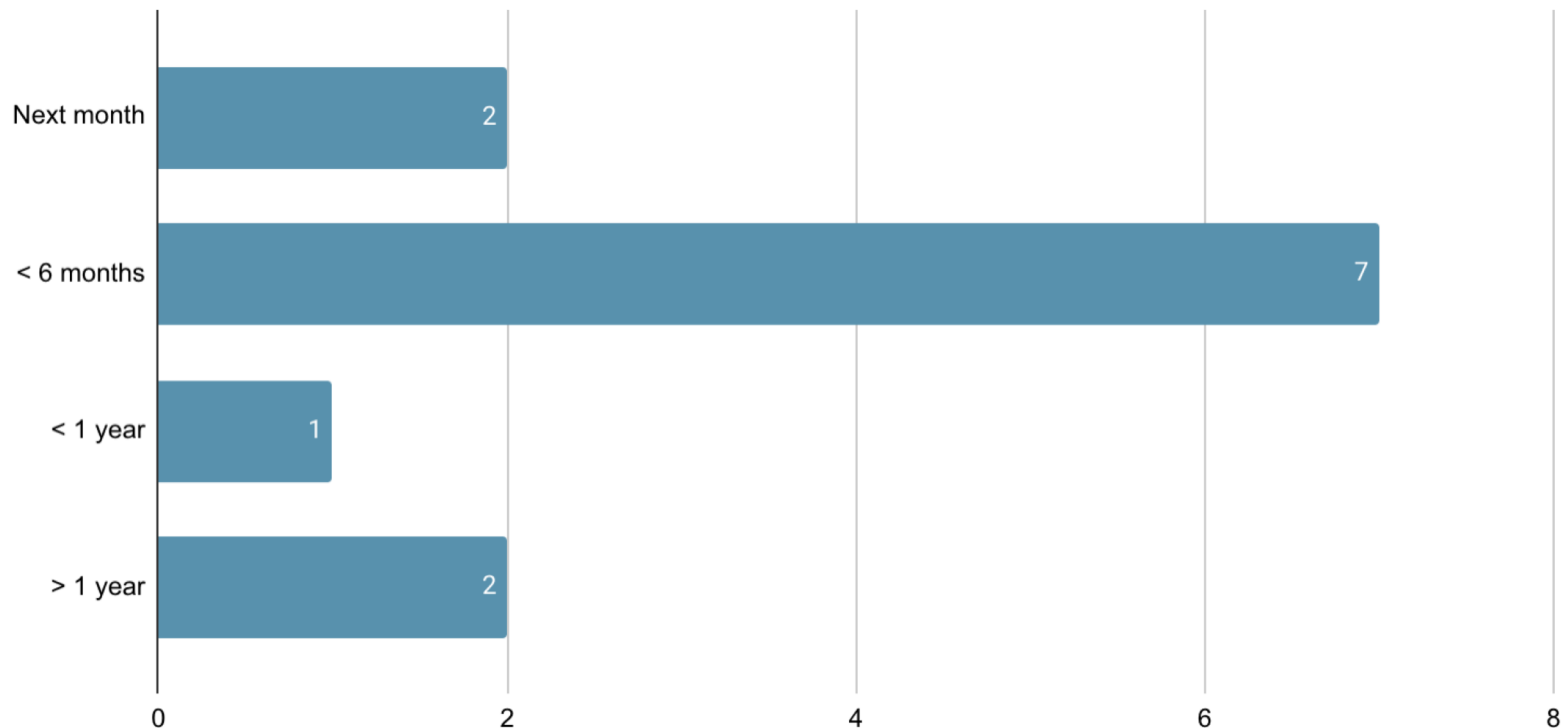


Learn More!

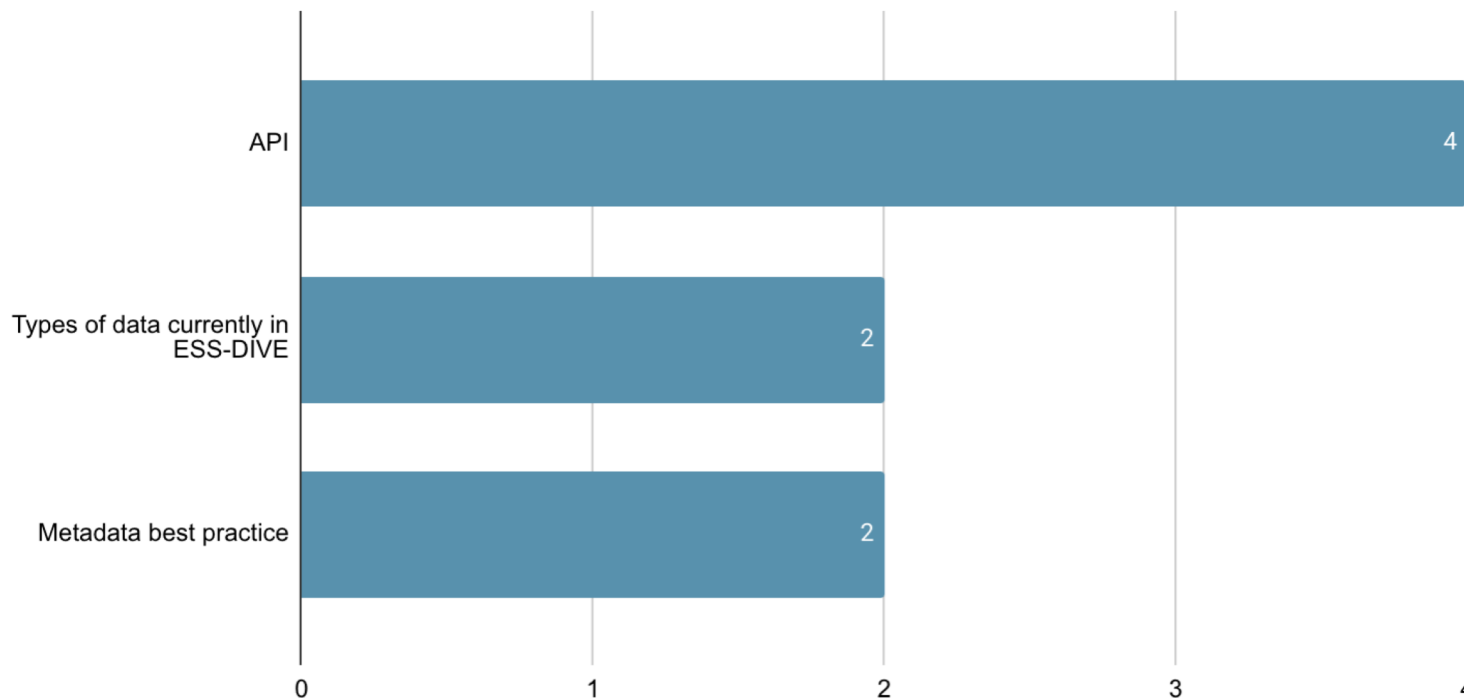
Stay tuned in to hear about advanced tools and features on ESS-DIVE in future webinars!

- Programmatic submissions and updates to data packages on ESS-DIVE using the **Package Service API**
- **Customizable data portals** to organize your data collections
- Community **reporting formats** to standardize data file organization
- An ESS-DIVE **community github** to review and comment on data reporting formats

When do you think you'll submit data to ESS-DIVE?



What are some topics you want more information on?



Questions?

Detailed guides are available at docs.ess-dive.lbl.gov

Tutorial videos are on [ESS-DIVE Team YouTube channel](#)

Contact us at ess-dive-support@lbl.gov

ESS-DIVE Glossary

List of common ESS-DIVE terms :

- **DataONE** - The Data Observation Network for Earth (DataONE) is a distributed framework and sustainable cyberinfrastructure that provides open and secure access to Earth observational data. ESS-DIVE is a DataONE member.
- **DOE** - The U.S. Department of Energy (DOE) is a Cabinet-level department of the United States whose mission is to ensure America's security and prosperity by addressing its energy, environmental and nuclear challenges through transformative science and technology solutions.

ESS-DIVE Glossary (*cont.*)

- **DOI** - A Digital Object Identifier (DOI) is a unique alphanumeric string assigned by a registration agency (e.g., The Office of Scientific and Technical Information (OSTI)) to identify content and provide a persistent link to its location on the internet. ESS-DIVE assigns a DOI when your data package is published and made available electronically.
- **ESGF** - The Earth System Grid Federation (ESGF) is a collaboration that develops, deploys and maintains software infrastructure for the management, dissemination, and analysis of model output and observational data. It is an interagency and international effort led by the U.S. Department of Energy with various co-funding agencies.

ESS-DIVE Glossary (*cont.*)

- **ESS** - Environmental Systems Science (ESS) is a U.S. Department of Energy Office of Science program under the Biological and Environmental Research Program seeking to advance a robust predictive understanding of terrestrial surface and subsurface ecosystems.
- **ESS-DIVE** - Environmental System Science Data Infrastructure for a Virtual Ecosystem (ESS-DIVE) is a U.S. Department of Energy repository for earth and environmental science data, models and software generated from research on terrestrial and subsurface environments.

ESS-DIVE Glossary (*cont.*)

- **NCEAS** - The National Center for Ecological Analysis and Synthesis (NCEAS) at UC Santa Barbara partners with ESS-DIVE on data preservation. NCEAS is a DataONE member and a recognized expert in ecological data, digital libraries, and standards for data format.
- **NERSC** - The National Energy Research Supercomputing Center (NERSC) is the primary scientific computing facility for the Office of Science in the Department of Energy, and is the primary data storage center for ESS-DIVE.
- **ORCID** - The Open Researcher and Contributor Identifier provides anyone a persistent digital identifier (an ORCID iD) that distinguishes researchers from one another and provides a record that supports automatic links among all professional activities.

ESS-DIVE Glossary (*cont.*)

- **OSTI** - The Office of Scientific and Technical Information (OSTI), a unit of the U.S. Department of Energy Office of Science, partners with ESS-DIVE on providing Digital Object Identifiers and metadata enhancement for data packages submitted to ESS-DIVE.
- **Additional terms to consider defining:** KBase, EMSL, JGI GOLD, NMDC, Dynamic data citation, Data package, Metadata, API, Text file, Comma separated file, NetCDF file, FAIR, ID, ISGN, Data Repository, Digital Library, Project Space, Data Visibility, Data Usability, Data Accessibility, JIRA, GitHub, Community Funds, Large/Big Data, File-level metadata, Sample-level metadata, 'Scalability, Resilience, and Integration', User & Preservation Services, Community Engagement and Partnerships

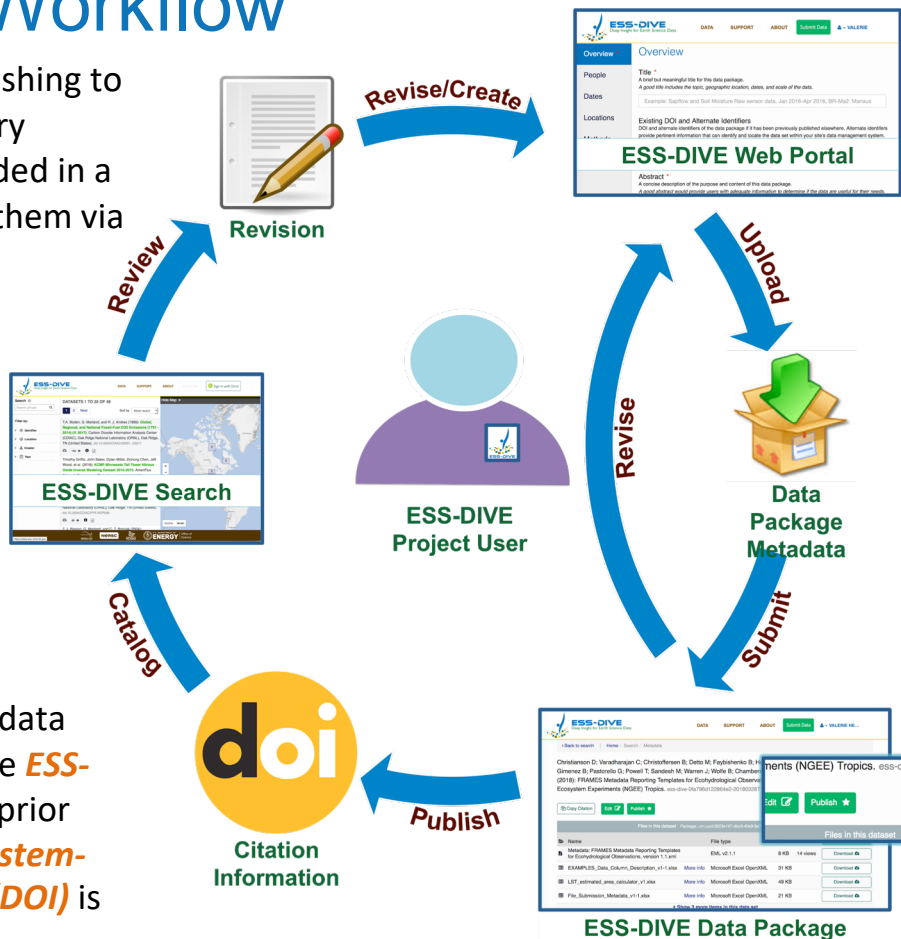
ESS-DIVE Workflow



An **ESS-DIVE project user** wishing to submit data to the repository gathers the files to be included in a data package, and uploads them via a web portal.

The data package is **shared publicly** and becomes available for search and **download** on the ESS-DIVE data portal

After the user requests the data package to be published, the **ESS-DIVE team** checks the data prior to public release, and a **system-assigned unique identifier (DOI)** is assigned.



The user specifies **metadata associated with the data package**, including author and citation information, as well as related references

The user uploads **data files** to be included in the data package

The user submits the data package which **saves the metadata and accompanying data files** to the ESS-DIVE Data Repository.

References

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